

Organic Nitrates

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Photooxidation of α -pinene in the presence of a thin film of deliquesced NaNO_3

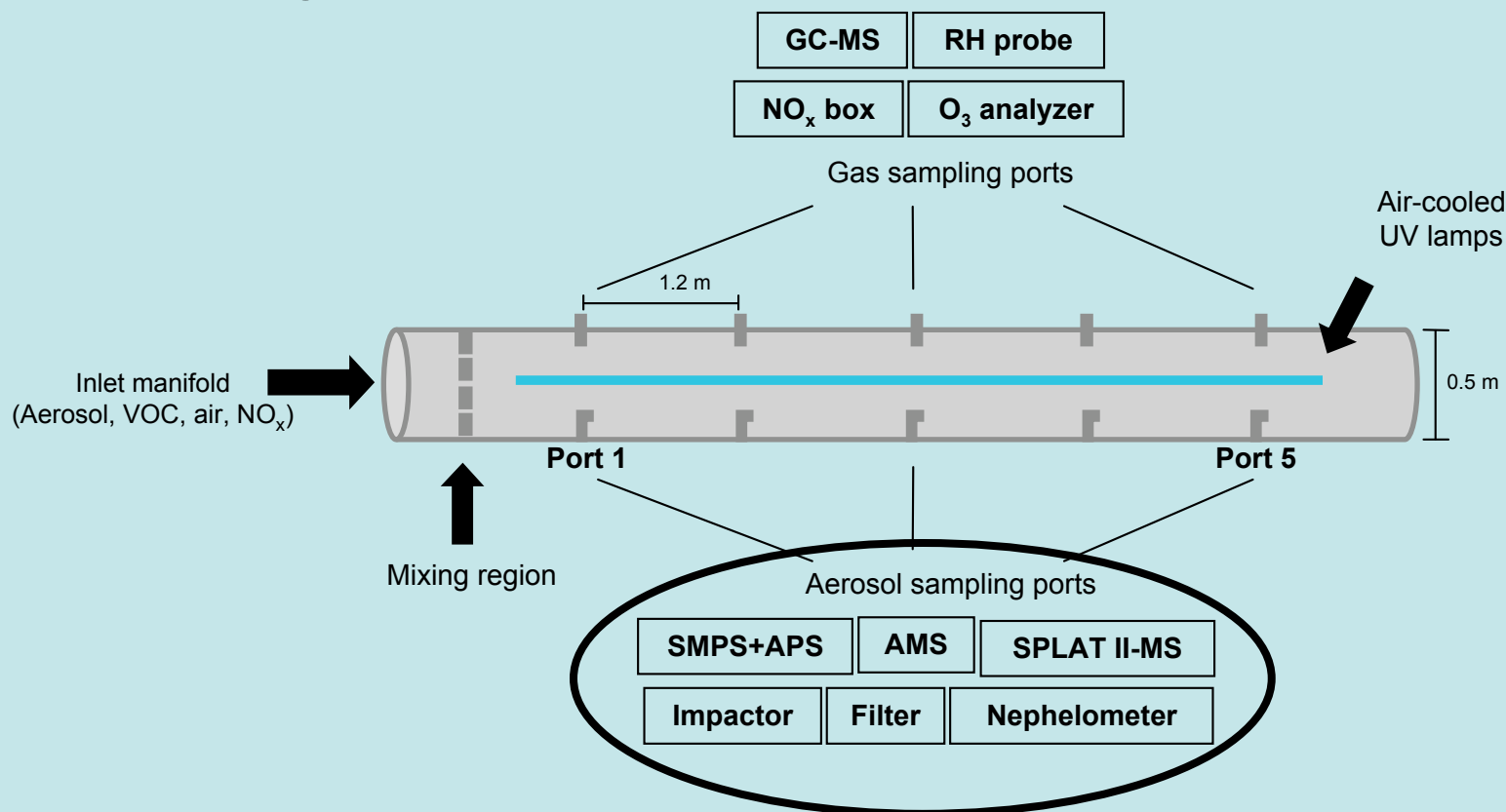


- Even a thin film of organic makes particles very hard to dry out (see Alla)

- Need techniques for RONO_2

Organic Nitrate Aerosol Characterization Studies: α -pinene + NO_3

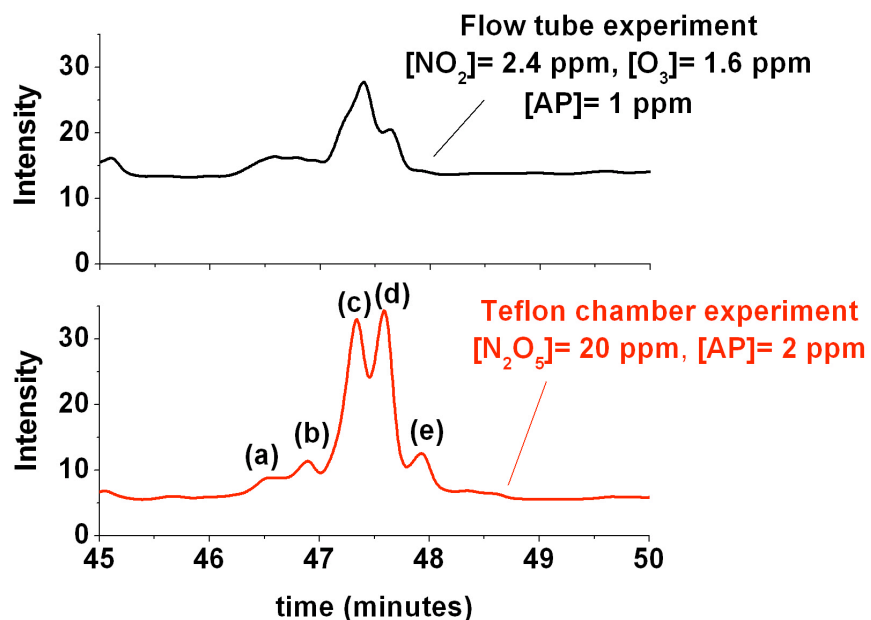
- Flow system



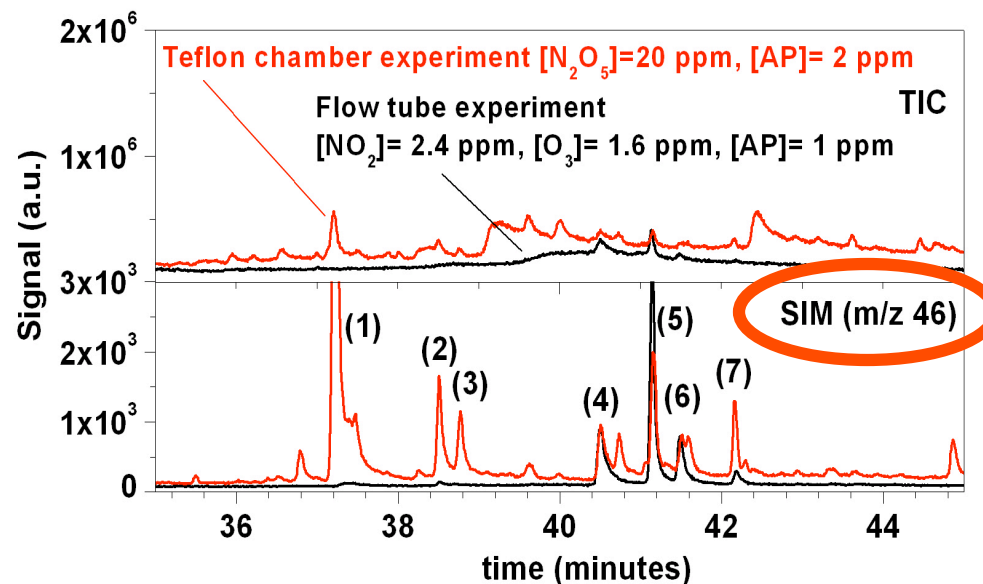
- Teflon chambers (static experiment)

HPLC-UV and GC-MS of Filter Samples from α -pinene + NO_3

HPLC (210 nm)



GC-MS (EI)



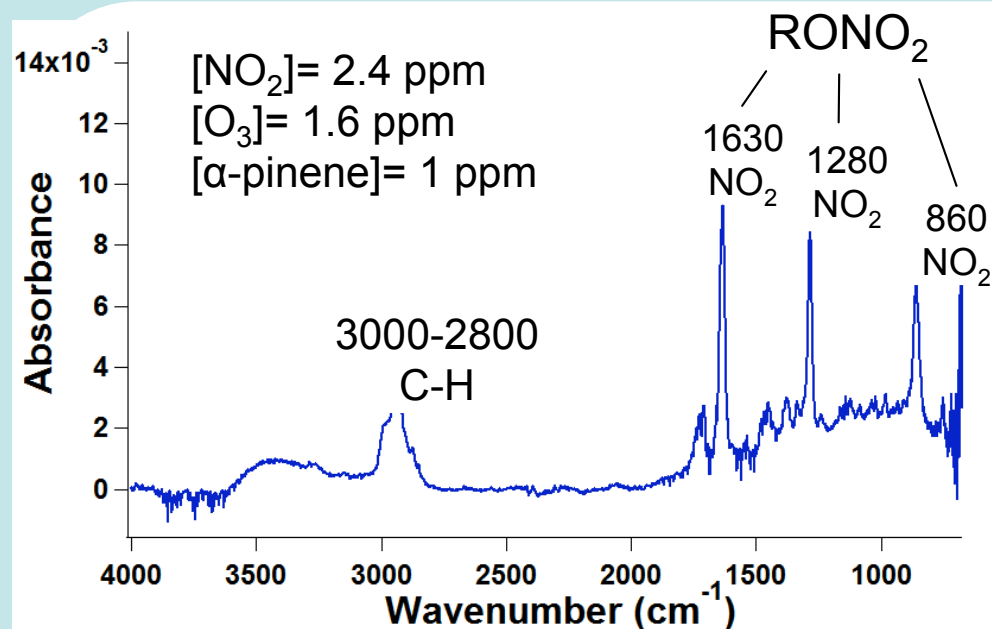
- Up to 7 different organic nitrates in particles have been seen by HPLC-UV and GC-MS

ORGANIC NITRATES FROM α -PINENE + NO₃ REACTION

Multifunctional organic nitrates ($\sim 10^{-6}$ – 10^{-8} atm) will partition between gas and particle phases:

- T, SOA dependence
- change in particle properties during transport
- transport of NO_y?

Flow Tube Experiment: α -pinene + NO_3

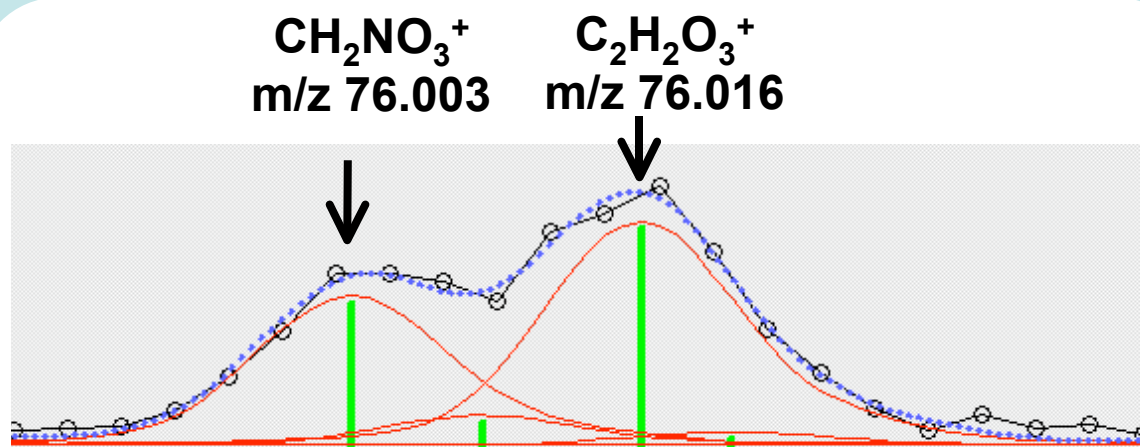


FTIR

- Total nitrate mass/total organic mass = 0.40 ± 0.02 assuming $\text{C}_{10}\text{H}_{17}\text{O}_4\text{N}$ (MW 215)

AMS

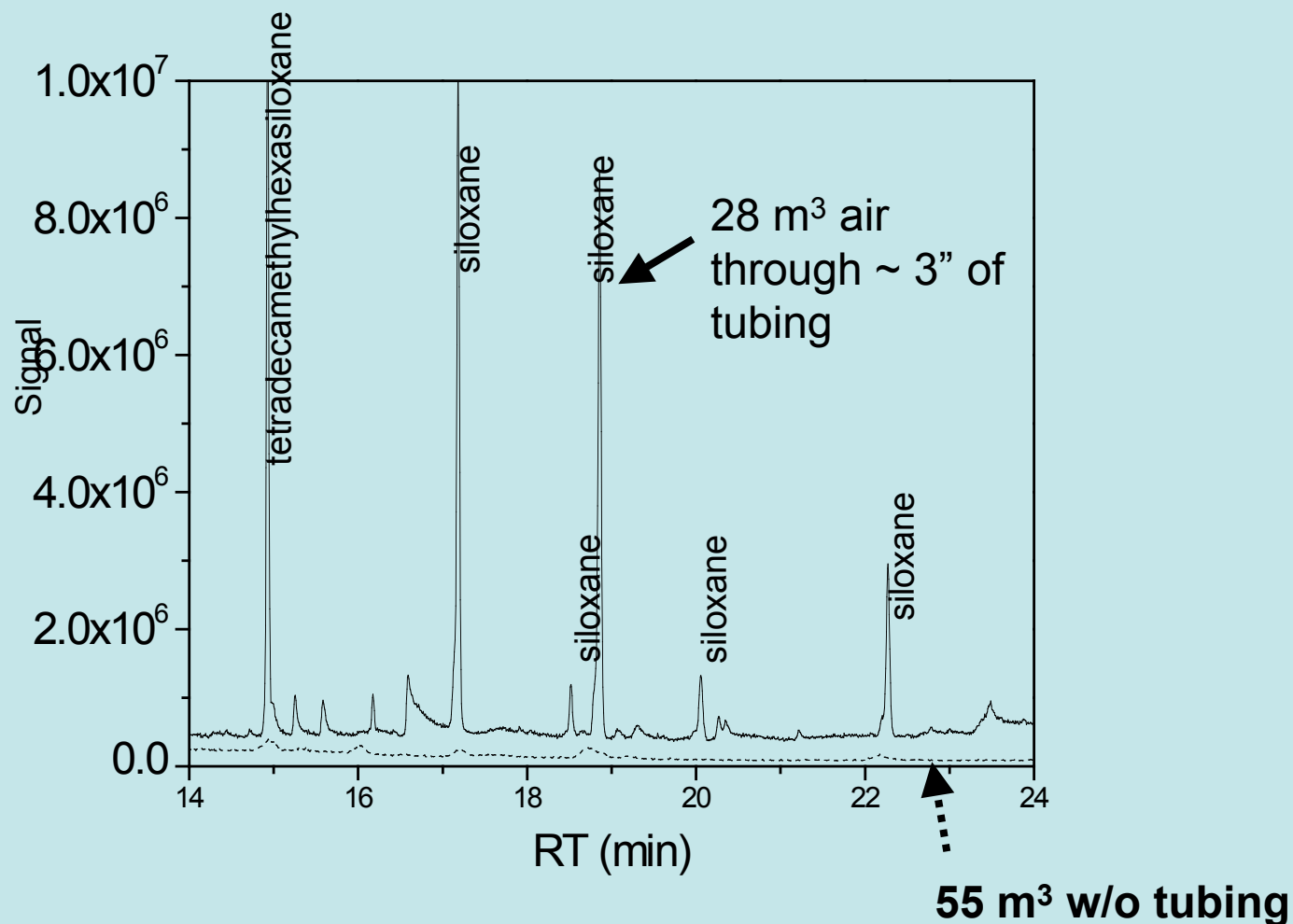
- Total nitrate mass/total organic mass = 0.12



AMS underestimates organic nitrate signal compared to FTIR

- **BUT** some specific organic nitrate fragments seen by hi-res

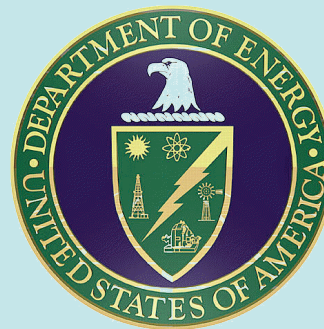
Siloxane Contamination from Electrically Conductive Tubing



- Impact on measured particle properties?

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